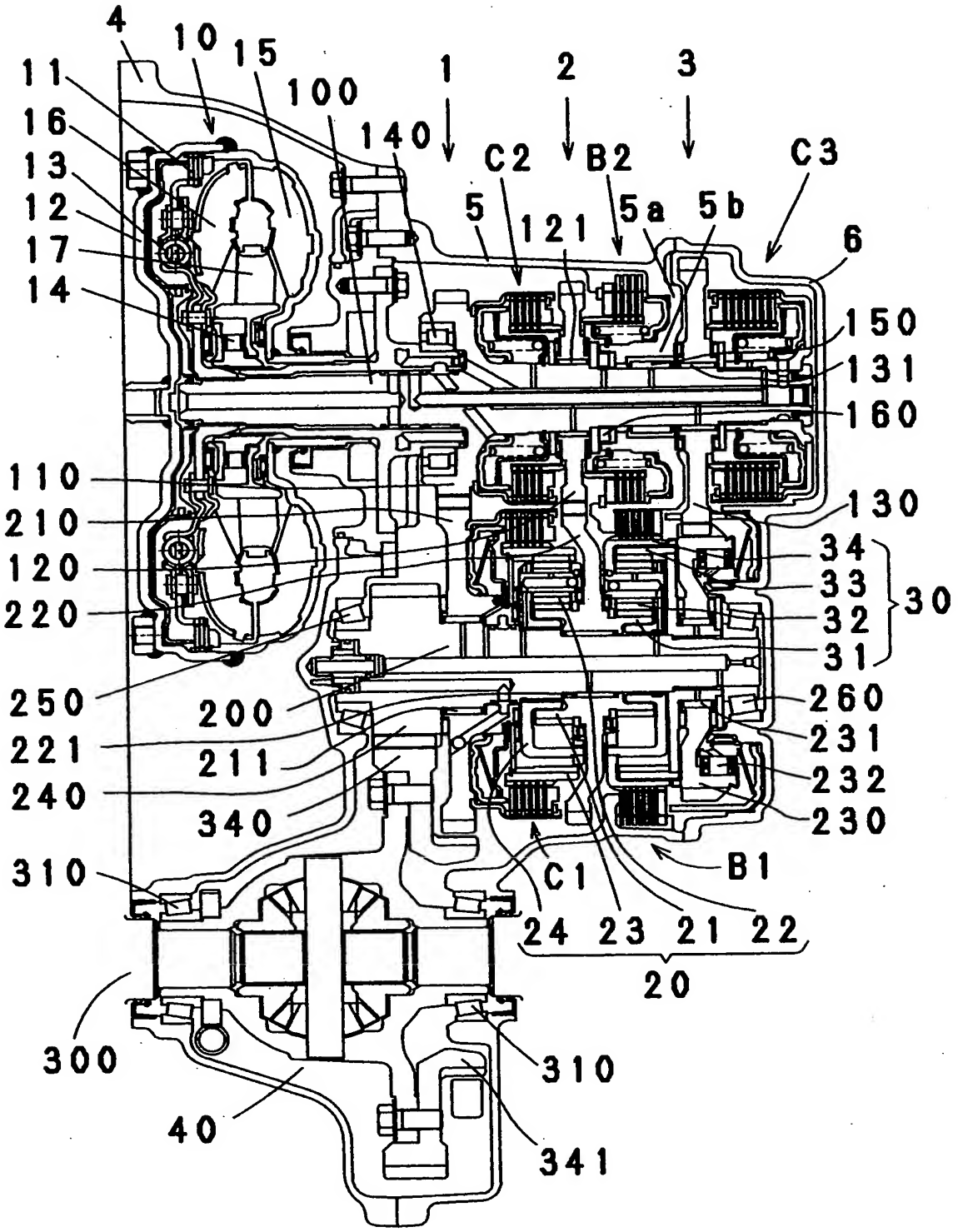
Fig1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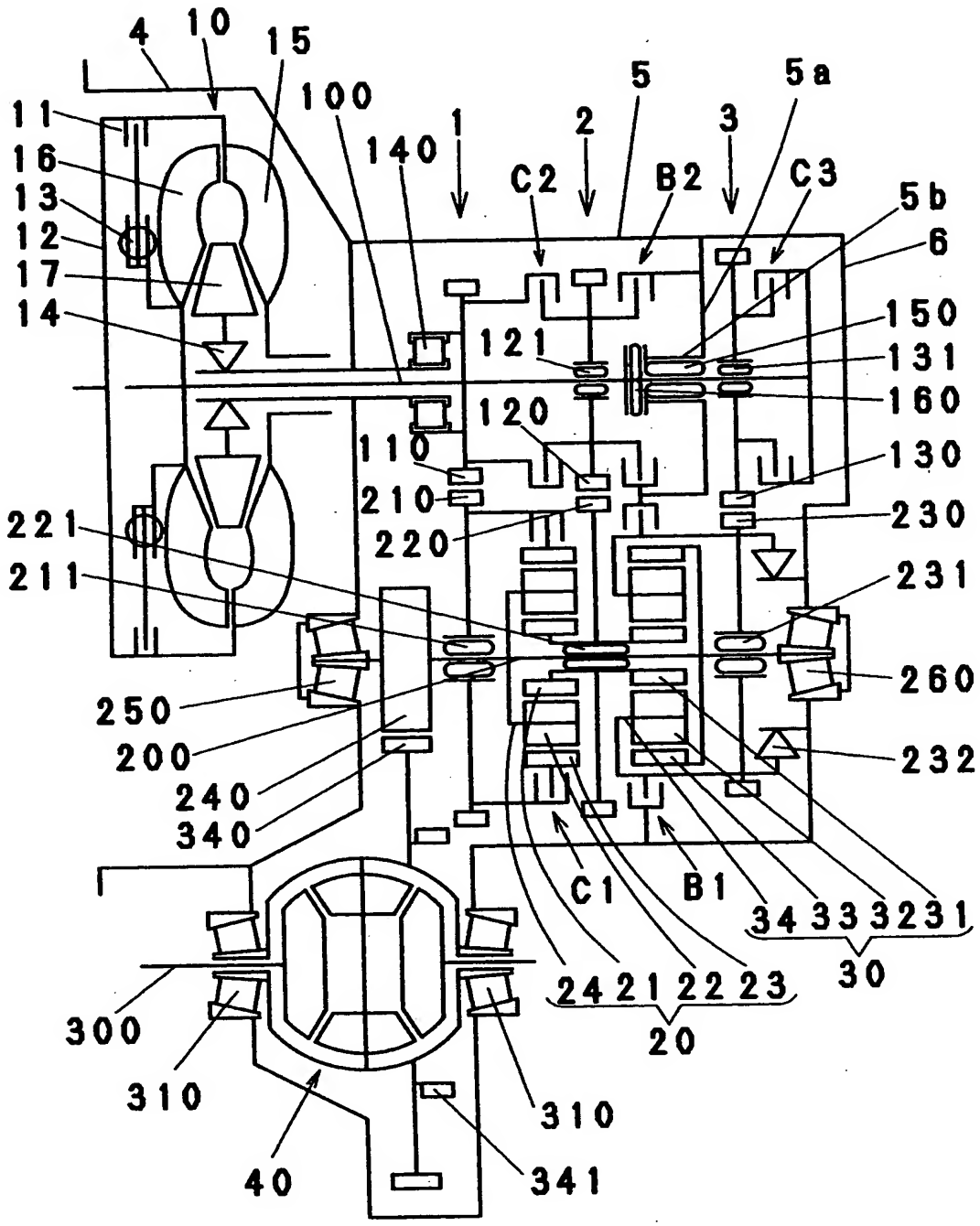
15
11
100
1
2
3
16
140
C2
B2
C3
13
5
121
5a
5b
12
6
17
150
14
131
160
110
130
210
34
120
33
30
220
32
31
250
200
260
221
211
231
240
232
340
230
310
C1
B1
24 23 21 22
20
300
310
40
341

Fig2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100
11
16
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140
1
2
5
3
5a
C2
B2
C3
5b
6
150
121
131
160
120
110
130
210
230
220
221
231
211
260
250
232
200
240
340
C1
B1
34 33 32 31
30
24 21 22 23
20
300
310
310
40
341

Fig3

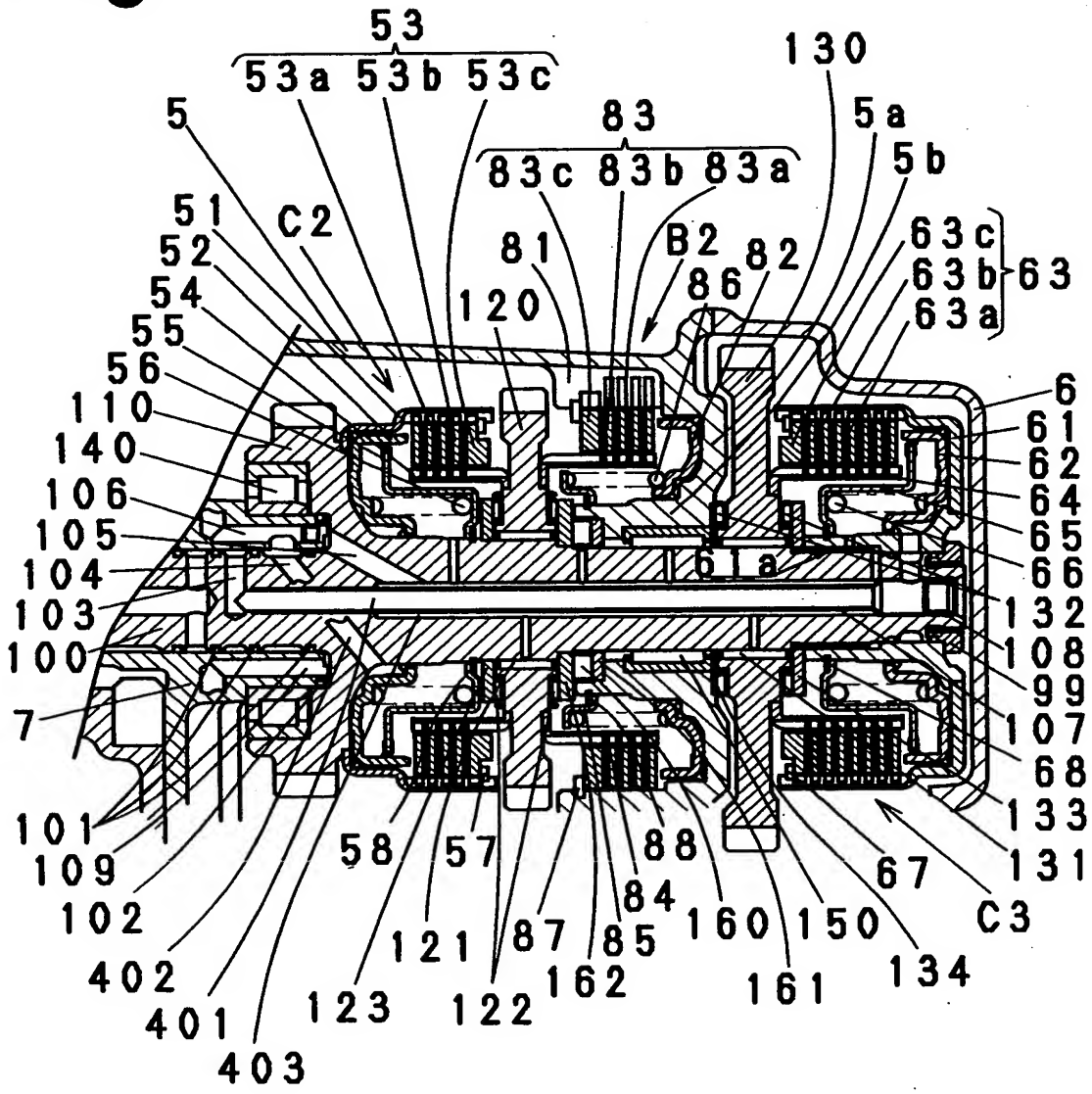

53
53a 53b 53c
130
5
83
83c 83b 83a
5a
5b
51
C2
52
81
B2
82
63c
63b
63
63a
54
120
86
55
56
110
140
106
105
104
103
100
7
61a
6
61
62
64
65
66
132
108
99
107
68
133
131
67
C3
101
109
102
402
401
403
58
57
123
121
122
87
162
85
84
88
160
150
161
134

Fig4

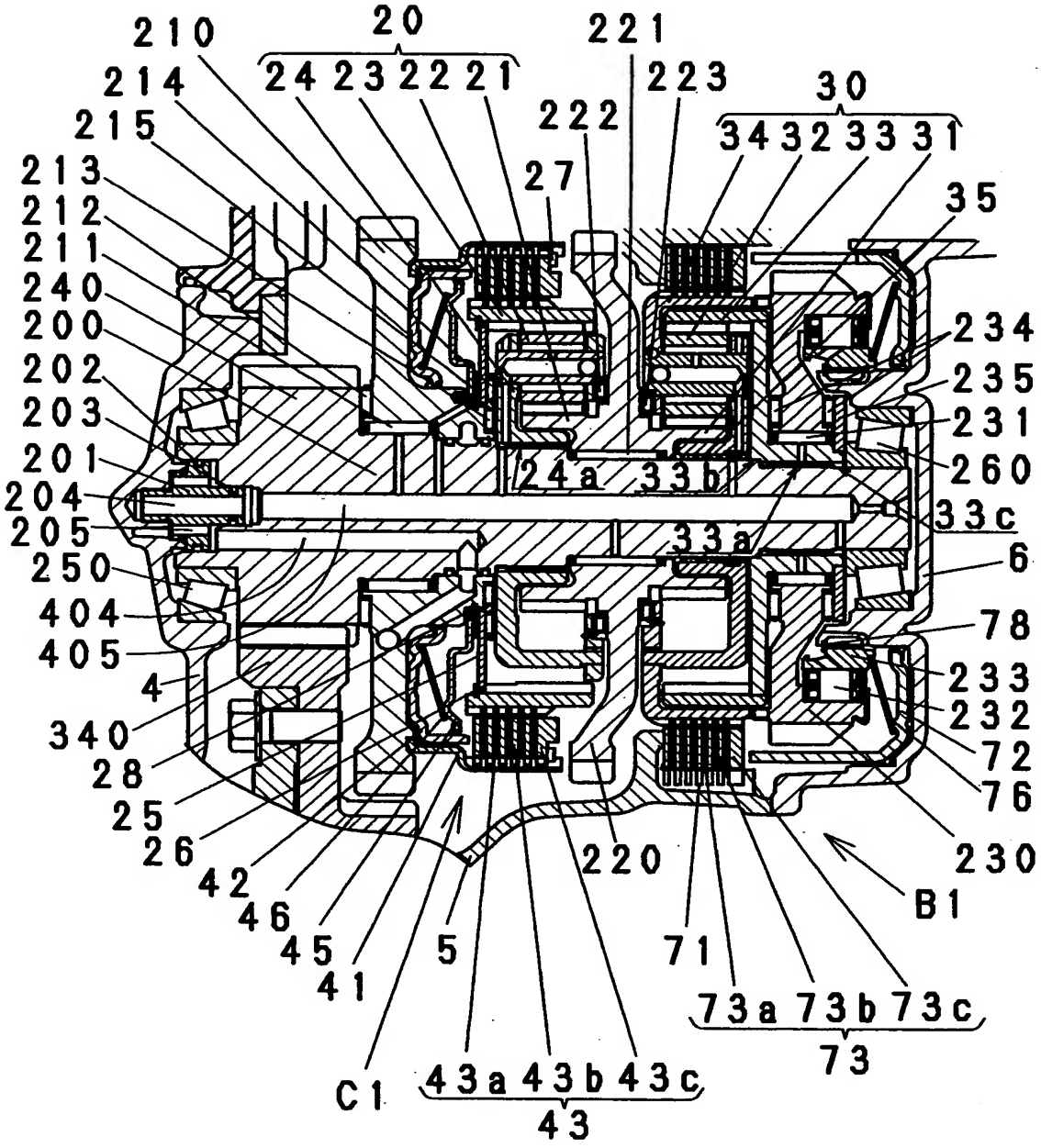
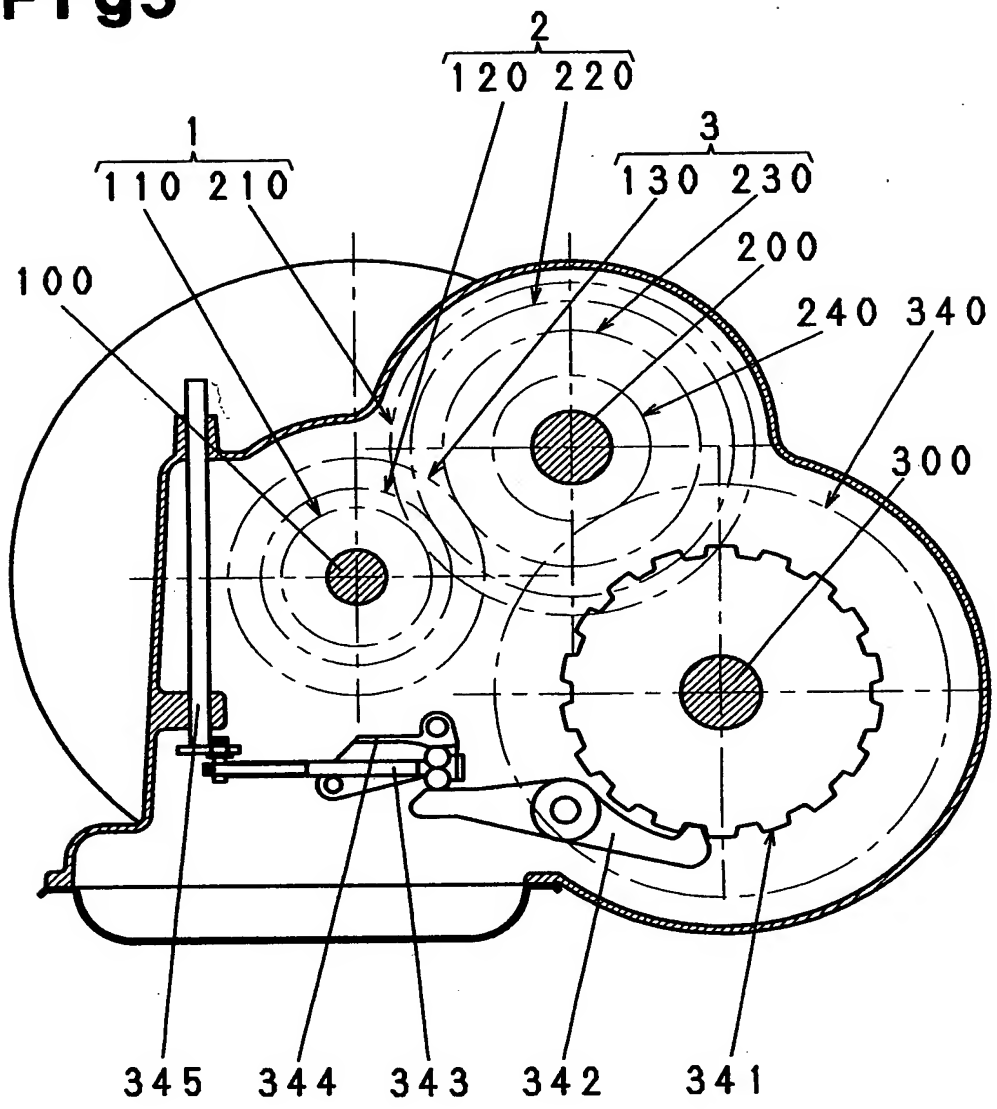

210
20
221
214
24 23 22 21
223
30
215
222
34 32 33 31
213
27
35
212
211
234
240
235
200
231
202
260
203
24a 33b
201
33c
204
205
33a
6
250
404
78
405
233
4
232
340
72
28
76
25
230
26
220
42
B1
46
45
71
5
41
73a 73b 73c
73
C1
43a 43b 43c
43

Fig5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120 220
1
110 210
3
130 230
200
100
240 340
300
345
344
343
342
341

Fig 6

COUNTER GEAR SET	1/REDUCTION GEAR RATIO	NUMBER OF TEETH OF COUNTER GEAR	
		FIRST SHAFT	SECOND SHAFT
1	$\alpha_1 = Z_{11}/Z_{12} = 0.628$	$Z_{11} = 54$	$Z_{12} = 86$
2	$\alpha_2 = Z_{21}/Z_{22} = 0.687$	$Z_{21} = 57$	$Z_{22} = 83$
3	$\alpha_3 = Z_{31}/Z_{32} = 1$	$Z_{31} = 70$	$Z_{32} = 70$

PLANETARY GEAR SET	TOOTH NUMBER RATIO	NUMBER OF TEETH SUN GEAR	NUMBER OF TEETH RING GEAR
1	$\rho_1 = Z_{S1}/Z_{R1} = 0.552$	$Z_{S1} = 37$	$Z_{R1} = 67$
2	$\rho_2 = Z_{S2}/Z_{R2} = 0.463$	$Z_{S1} = 31$	$Z_{R2} = 67$

Fig 7

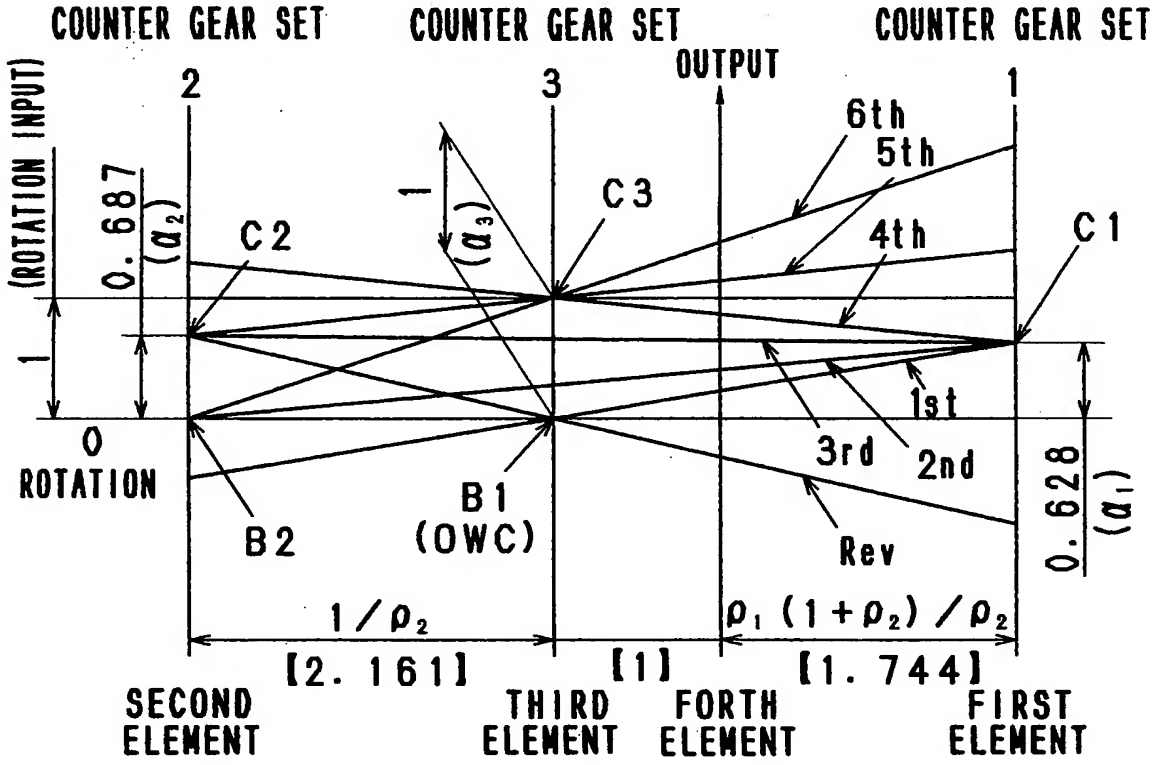

Fig 8

SHIFT	ENGAGED	RATIO	STEP	RANGE
1st	C1, B1	4.369	>1.768	>6.387
2nd	C1, B2	2.471	>1.588	
3rd	C1, C2	1.556	>1.345	
4th	C1, C3	1.157	>1.334	
5th	C2, C3	0.867	>1.268	
6th	B2, C3	0.684		
Rev	C2, B1	3.231		

Fig 9

COUNTER GEAR SET	1/REDUCTION GEAR RATIO	NUMBER OF TEETH OF COUNTER GEAR	
		FIRST SHAFT	SECOND SHAFT
1	$\alpha_1 = Z_{11}/Z_{12} = 0.628$	$Z_{11} = 54$	$Z_{12} = 86$
2	$\alpha_2 = Z_{21}/Z_{22} = 0.591$	$Z_{21} = 52$	$Z_{22} = 88$
3	$\alpha_3 = Z_{31}/Z_{32} = 0.944$	$Z_{31} = 68$	$Z_{32} = 72$

PLANETARY GEAR SET	TOOTH NUMBER RATIO	NUMBER OF TEETH SUN GEAR	NUMBER OF TEETH RING GEAR
1	$\rho_1 = Z_{S1}/Z_{R1} = 0.552$	$Z_{S1} = 37$	$Z_{R1} = 67$
2	$\rho_2 = Z_{S2}/Z_{R2} = 0.463$	$Z_{S1} = 31$	$Z_{R2} = 67$

Fig 10

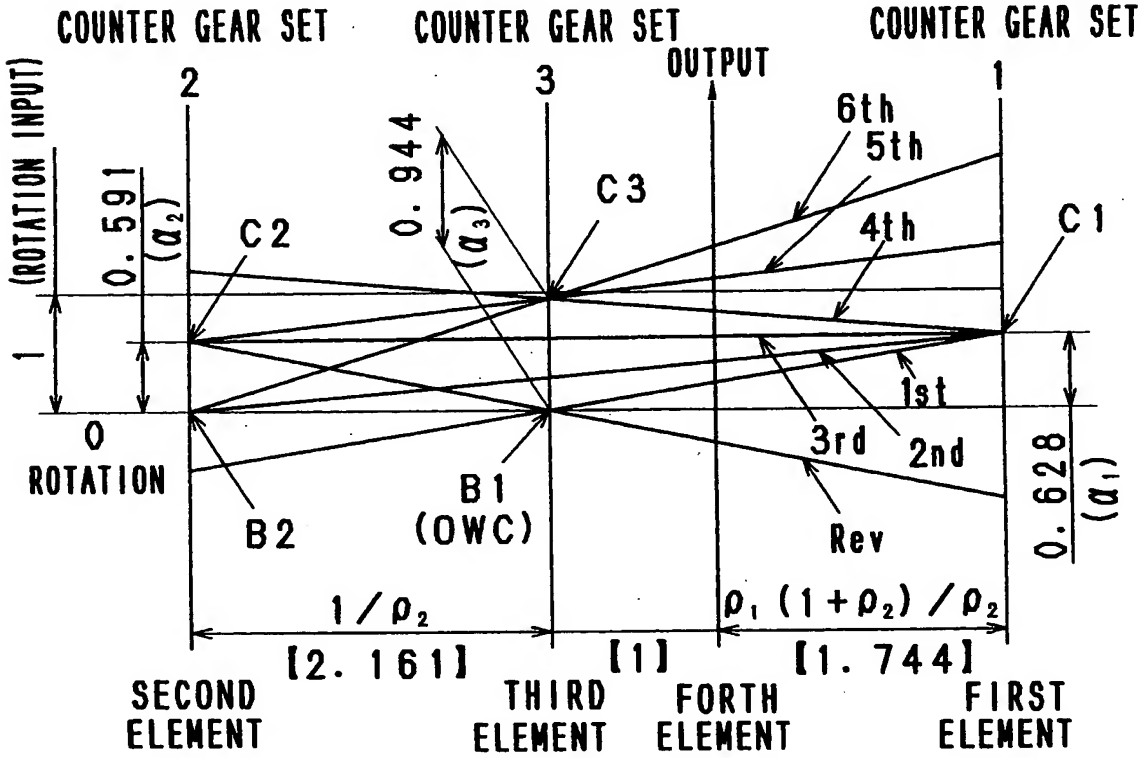

Fig 11

SHIFT	ENGAGED	RATIO	STEP	RANGE
1st	C1, B1	4.369		
2nd	C1, B2	2.471	>1.768	
3rd	C1, C2	1.623	>1.522	
4th	C1, C3	1.206	>1.345	>6.035
5th	C2, C3	0.904	>1.334	
6th	B2, C3	0.724	>1.249	
Rev	C2, B1	3.632		